THE STOCKHOLM CONGESTION CHARGES – FOUR YEARS ON. EFFECTS, ACCEPTABILITY AND LESSONS LEARNT

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Abstract

Congestion charges were introduced in Stockholm in 2006, first as a trial followed by a referendum, then permanently from 2007. This paper discusses what conclusions can be drawn from the first four years of operation. We show that the traffic reduction caused by the charges' has increased over time, once external factors are controlled for. Alternative-fuel vehicles are exempt from the charges, and this has substantially increased the sales of such vehicles. We discuss public and political acceptability, synthesizing recent research and Swedish experience, and conclude that objective and subjective effects as well as general environmental and political attitude played a role for the high levels of public support, while institutional reform and resolving power issues were necessary to gain political support. Finally, we briefly discuss implications for the transport planning process in general.

INTRODUCTION

Congestion pricing has been long advocated by transport economists and traffic planners as an efficient means to reduce road congestion. Despite growing problems with urban congestion and urban air quality, and despite a consensus that investments in roads or public transit will not be sufficient to tackle these problems, cities have been reluctant to introduce congestion pricing.

In recent years, however, it seems as if this is changing. London (2003), Stockholm (2006), Durham (2002), Milano (2008), Rome (2001) and Valletta (2007) have all introduced road user charges to combat congestion and/or environmental problems. The Netherlands, Copenhagen, Budapest, Gothenburg, Djakarta, San Francisco and New York all consider or plan to introduce congestion charges. The soon ubiquitous "value pricing" roads in the US are another example of how congestion problems are now being tackled through pricing measures. New York, Manchester and Edinburgh have all tried to introduce congestion charges, and even if these attempts have been unsuccessful, it is a sign that congestion charges are being seriously considered to a greater extent than a decade ago.

The congestion charges in Stockholm have attracted enormous attention worldwide. Obviously, the opportunity to gauge the effects of congestion charges on traffic, congestion levels and travel behaviour has attracted great interest. But perhaps even more interesting is the fact that the congestion charges survived a very complicated political and legal process, including a referendum initially forced through by the opponents of the charges. In many ways, the most interesting from the perspective of other cities is that the Stockholm charges went from "the most expensive way ever devised to commit political suicide" (to quote the then-secret feelings expressed by the Head of the Congestion Charging Office[1]) to something that the initially hostile media declared to be a "success story" (Dagens Nyheter, June 22, 2006).

The Stockholm charges were introduced four years ago in January 2006. This gives us the opportunity to study the effects of the charges in the longer term – not only the effects on traffic and congestion, but also on acceptability and to some extent the effects on the national infrastructure planning process.

As to traffic effects, there has been some apprehension that the effects of the charges will attenuate over time – either because drivers "get used to charges" and hence do not react to them anymore, or because the freed-up road space will get filled back up again, so the congestion situation will be the same as before the charges. This is the topic of section 2, where we try to explore the issue of the long-run effect of the charges on traffic volumes.

Section 3 investigates the significance of the clean car exemption and the importance of different incentives on the sales of clean cars.

[1] Quote Gunnar Söderholm, social-democratic head of the Congestion Charging Office during the trial, when (after the trial) describing the local Social Democrats' feelings when the national Social Democratic government more or less forced the congestion charges onto the local Stockholm party district.

Section 4 is devoted to public and political acceptability. We draw from a number of sources to explain and discuss the current opinion on congestion charges, and the political context of the charges. We also discuss the impact the possibility to introduce charges has had on the national infrastructure planning process.

AN OVERVIEW OF THE STOCKHOLM CONGESTION CHARGING SYSTEM

The Stockholm congestion charging system consists of a simple toll cordon around the inner city, thereby reducing traffic through the bottlenecks located at the arterials leading into the inner city. The cost of passing the cordon between 6.30-18.30 weekdays is € 2[2] during peak hours (7:30-8:30, 16:30-18:00), € 1.5 during the shoulders of the peaks (30 minutes before and after peak period) and € 1 during the rest of the charged period. The charge is levied in both directions, implying that a return trip during peak hours costs the double. The maximum fee per day is € 6.

The system was introduced on a trial basis during the period 3 January – 31 July 2006. The trial period was followed by referendums in the City of Stockholm and in about half of the neighbouring municipalities, originally pushed through by parties opposed to the congestion charges. The referendum in the City of Stockholm ended with a majority for keeping the charges, but adding all votes up, a majority of the voters in the county was against the charges. However, the results could be viewed as a bit skewed, since most of the municipalities where polls showed greater support for the charges did not arrange a referendum at all; in most cases, these municipalities argued that it was up to the city of Stockholm to decide the issue. In the end, the new Liberal-Conservative government decided to reintroduce the congestion charges, earmarking the revenues for road investments but as a part of a more comprehensive, partially government-funded transport investment package including both road and transit investments. The congestion charges were reintroduced in August 2007.

The charging trial has been described in detail elsewhere. A description of the effects can be found in Eliasson et al. (2009). A detailed account of the political process can be found in Gullberg and Isaksson (2009), and experiences from the design and evaluation processes are described in Eliasson (2009a). Isaksson and Richardsson (2009) analyse the strategy to create legitimacy for the charges, while Gudmundsson et al. (2009) examine how decision support systems were used. Eliasson (2008) discusses the main lessons from the trial in terms of design, effects, acceptability and political process. Eliasson (2009b) provides a cost-benefit analysis of the congestion charges, based on effects measured during the trial.

LONG-TERM ADAPTATION EFFECTS

The charges had a substantial effect on traffic volumes, and drivers have adopted many different adaptation strategies, from the first day of introduction in January 2006. In this

[2] [2] Throughout the paper we have converted SEK to Euro using an approximate conversation rate of 10 SEK/€.

chapter we explore to what extent the behavioural adaptation mechanisms has changes over time.

Traffic volumes across cordon

Figure 1 shows the average number of passages over the cordon per weekday (6 am to 7 pm) for each month from January 2005 through December 2009. Corresponding numbers are presented in Table 1.

For each of the studied years, Figure 1 exhibits a systematic seasonal variation, with volumes increasing throughout spring, showing a distinct minimum in July and August (summer holidays) and stable volumes during the rest of the year.

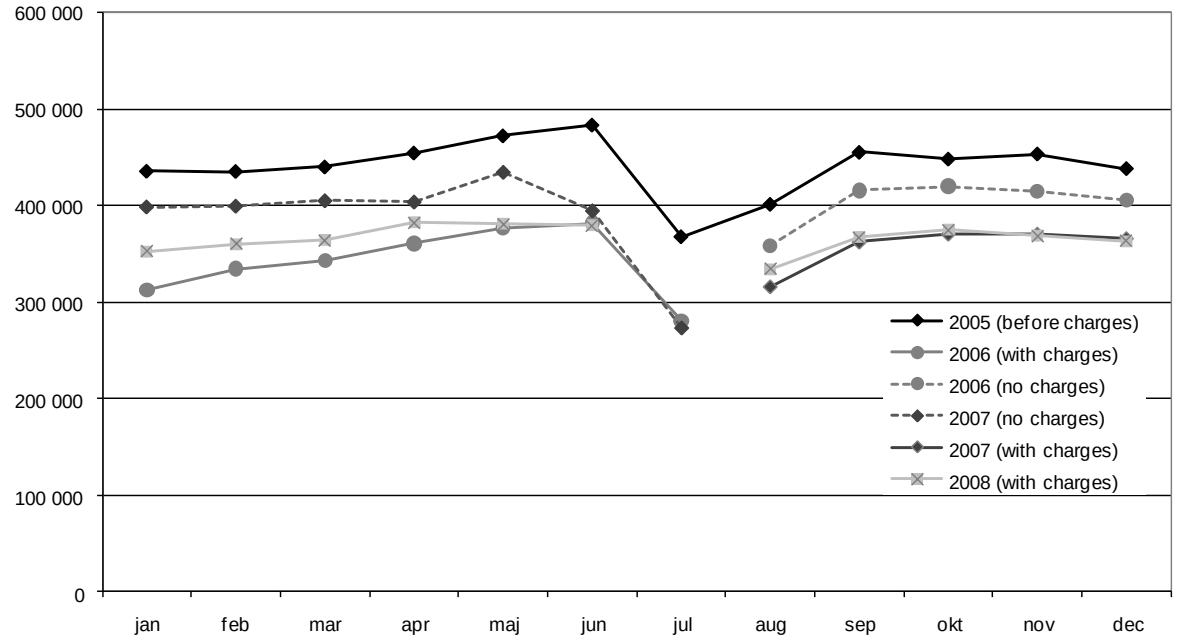

Figure 1: Average number of passages across cordon (weekdays 6-19). 2005-2009[3]

Table 1: Reduction in traffic volumes over cordon (weekdays 6-19) compared to reference (2005)
Figures in Italic represent period without charging (Aug 2006 – Jul 2007)

Compared to 2005	Jan	Feb	Mar	Apr	May	Jun	Jul[4]	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
2006	**-28%**	**-23%**	**-22%**	**-21%**	**-20%**	**-21%**	**-24%**	*-11%*	*-9%*	*-6%*	*-9%*	*-7%*
2007	*-9%*	*-8%*	*-8%*	*-11%*	*-8%*	*-18%*	-26%[5]	**-21%**	**-20%**	**-17%**	**-18%**	**-17%**
2008	**-19%**	**-17%**	**-17%**	**-16%**	**-19%**	**-22%**	-	**-17%**	**-19%**	**-16%**	**-19%**	**-17%**
2009	**-19%**	**-18%**	**-16%**	**-16%**	**-19%**	**-24%**	-	**-17%**	**-18%**	**-15%**	**-17%**	**-20%**

[3] For months when charging was applied, the numbers in Figure 1 are those that were registered by the charging system, and therefore very precise. For other periods, numbers are to some extent estimated based on calculations from other traffic counts. Comparability between years for "corresponding" months is somewhat compromised by calendar effects: a number of national and school holidays alternate between months.
[4] In 2007-2009 the congestion charging system was not operating in July, and hence no measurements in July.
[5] The figure for June and July 2007 is affected by major roadworks.

The trial: Immediate reaction, slightly diminishing over time

Figure 1 indicates clearly that the charges had a substantial effect on car driver behaviour from the first day of introduction in January 2006. This effect, as reflected by relative difference to the reference level (2005), was -28 % in January.

During the following months, volumes across the cordon increased successively – from just over 300 000 per day in January, to almost 400 000 per day in May. Some observers in media and the public saw this increase (large enough to be noticed by the naked eye) as a sign that the charges were successively losing their effectiveness. However, to the informed analyst, it was clear that the increase was mainly due to seasonal variation, and that the pattern exhibited was very similar to what was seen in the reference figures for 2005. Nevertheless, there were indeed also indications that road users had overreacted somewhat to the charges at first (with an estimated effect of -28 % in January, -24 % in February and -23 % in March), but successively found more stable adaptation strategies (-22 % in April, May and June).

Of all commutes crossing the cordon, 24 % disappeared, nearly all of these switched to transit – only one percentage switched route to avoid the cordon. Of the discretionary car trips crossing the cordon 22 % disappeared, the main adaptation strategies seem to have been changing destinations and decreasing trip frequencies. Commercial traffic (deliveries, business trips, freight traffic etc.), decreased approximately 15 %, which adapted by switching route or by trip chaining. (Eliasson, 2008)

The in-between period: Traffic increased, but some effects of charging remained

As from August 1st 2006, charges were no longer in effect. As expected, this had a direct and observable effect on traffic volumes across the cordon, which immediately rebounded to levels substantially higher than during the charging trial. However, the charging scheme continued to affect road user behaviour also after the trial had ended; from August 2006 to August 2007, i.e. between the end of the trial and the reintroduction of the charges, traffic volumes remained 5-10 %[6] lower than in 2005.

Why did car drivers not return to their old habits in the period when no charges were levied? As always, it is impossible to certify the cause-effect relationship underpinning our observation of a residual traffic decrease. What we know is that other factors, such as fuel prices, changed too little to cause such a relatively large traffic decrease (it should be noted that traffic across the cordon had remained stable for around 15 years, with a maximal variation of around 3 %). Apparently, some car users developed new travel habits during the trial – habits persisting even after the charges were abolished. That may have been either because they had, under the pressure of charges, been pressed to search for travel alternatives, and found such alternatives that were indeed more suitable for them, once they were tested. Or it may have been because they had been forced to invest in alternative travel options (e.g. buying a motorcycle), which could not be changed back without new transaction costs. (Other discussions of such "hysteresis" effects can be found in Goodwin, 1997, and Dargay, 1993.)

[6] The exact size of the residual effect is uncertain, since data from this period are less reliable due to road works and technical problems with the measurement equipment.

Permanent charges: Immediate effects, successive volume increase due to externals factors
Charging was reintroduced in August 2007. Compared to the old reference (2005) the introduction of permanent charges had the same effect on traffic volumes as charging had had during the trial: In August 2007 there were 21 % fewer passages across the cordon (during charging hours) than in August 2005.

During the first year of permanent charges, volumes over the cordon increased, and the so-called "effect" of charging (difference to 2005 reference) decreased. In the end of 2008 the difference was -17 %, apparently substantially lower than the -22 % at which "effects" had stabilized at the end of the trial. There are some indications that a continued increase of volumes occurred also in 2009, although this picture is much less clear. For most months, however, volumes in 2009 are about 1 % larger than for the corresponding month in 2008.

Have the effects attenuated over time?

The observed successive increase of cordon volumes described in the previous section can at first sight be interpreted as if the effects of the charges attenuate over time, in other words that the price elasticity on the traffic volumes decreases. However, this interpretation does not take into account that various other factors influencing traffic volumes have changed over time. In this section we will compare the long-term and short-term effects of charging, taking these external factors into account. Note, however, that as time passes, it becomes increasingly to separate the effects of the congestion charges from other external factors.

There are two reasons why the long-term effects could be *smaller* than the short-term effects. First, there is the "acclimatisation" effect: after a while, people might get used to the charge and consider it less important when making their travel choices. This effect could be especially important if it is, at first, a little difficult to pay the charge – and the extra "cost" of actually making the payment might decrease over time. Second, the freed-up road space induces new traffic – travellers with higher values of time, or travellers making car trips not crossing the cordon.

There are also a number of reasons why the long-term effects could be *larger* than the short-term effects. The possibilities to adapt travel behaviour are larger in the long run. Over time, people continuously reorganize their lives, relocate place of residence or work, get familiar with new destinations or change other habits, and in this process they will take the permanent charges into account. The fact that the charges were first implemented as a "trial" might also have implied smaller behavioural effects in the short run because they decided to wait it out.

To calculate the real long term effect of charging, we need to assess what the traffic volumes would have been in 2009, without charges. We must also take into account that the average charge has changed over time.

Starting with the traffic volumes, we need to approximate the joint contribution of the most important external factors affecting traffic volumes. As part of the Stockholm trial evaluation, a time series model was estimated specifically on data on traffic flow across the cordon 1973-2005 (Eliasson, 2009b). The time series analysis reveals the impact on traffic from various external factors, which is summarized in Table 2. The same table shows the development of these external factors in Stockholm County between the years 2005 and 2008. Transferring

these numbers to effects on traffic volumes in the period 2005-2009 gives that the external factors jointly have contributed to a 5.6 % increase in traffic volumes crossing the cordon.

There was an 18 % reduction in traffic volumes from 2005 to 2009. Controlling for the external factors, charging effectively reduces the traffic through the inner-city cordon 23.8 %, which is slightly more than the reduction during the trial.

Table 2: Impact on the traffic from external factors in Stockholm County, 2005-2008.

Development of external factors in Stockholm county, 2005-2008.					
	2005	2006	2007	2008	2009
Number of people in employment	0.0%	1.6%	4.0%	7.4%	8.1%
Fuel price (€/litre, 95 oct)	0.0%	2.9%	5.3%	5.5%	1.4%
Private cars per employed person	0.0%	0.0%	-1.3%	-2.6%	-1.6%
Impact on the traffic from external factors in Stockholm county, 2005-2008.					
	2005	2006	2007	2008	2009
Number of people in employment	0.0%	1.4%	3.4%	6.3%	6.9%
Fuel price 95 oct, €/litre	0.0%	-0.9%	-1.6%	-1.6%	-0.4%
Private cars per employed person	0.0%	0.0%	-0.7%	-1.3%	-0.8%
Sum	0.0%	0.5%	1.1%	3.2%	5.6%
Elasticities					
Number of people in employment	0.85				
Fuel price (€/litre, 95 oct)	-0.3				
Private cars per employed person	0.5				

Next, we continue by assessing how much the average charge has changed over time. Exemptions and tax-regulations have changed over time in such a way that the average charge has decreased. The charges are now deductible for some commuters, which was not the case during the trial in 2006. This applies to approximately 8 % of all trips. The tax deductibility represents a 60 % reduction of the charges.

A "company car" denotes a company-owned car used by an employee for both work-related and private purposes. Company cars, which constitute 17 % of all vehicles crossing the charging cordon, also receive at least a 60 % reduction of the congestion charge (about 20 % of all company cars pay no charge at all). During the trial, no such discount was received. (The drivers are now allowed to pay the charge from their gross salary. This was not allowed during the trial.)

In addition to increased tax deductibility and company car regulations, inflation has also contributed to a decrease of the average cost per car crossing the cordon. On average, the charge has decreased 16% in real terms since 2006.

Passages with taxis, which were exempt from congestion charge during the trial, are no longer exempt. Still, the share of exempt vehicles has remained constant, due to the rapid increase of

alternative fuel vehicles, which were exempt through 2009[7]. The proportion of passages made by alternative fuel vehicles has increased from 3% during the trial to 14% in 2009.

However, most alternative fuel vehicles are taxis (2% out of 14%), company cars or cars in commercial traffic (9% out of 14%). Taxis and commercial traffic are presumably relatively price insensitive. For company cars the tax-deduction regulation would apply if alternative fuel vehicles had not been exempt. For these reasons, the increased share of alternative fuel vehicles has so far only contributed to a minor increase in traffic volumes across the cordon.

The effects on the average charge due to the changes in taxation and regulation discussed above are summarized in over time. This result is correspondence's with Goodwin (1992), who notes that price impacts tend to increase over time as consumers have more options (related to increases in real incomes, automobile ownership, and perhaps telecommunications that can substitute for physical travel).

[7] Alternative fuel vehicles bought 2010 or after are not exempt. Alternative fuel vehicles registered before 1 January 2009 are only exempt from the charges until 1 August 2012.

Table 3. Considering also changes in traffic volumes since 2006 we are able to compute the price elasticity on traffic volumes across the cordon in the same table.

The median length of trips crossing the cordon is 13 km, according to the travel survey carried out during the trial. During the trial the average congestion charge of EUR 1.28 per passage, implying a price elasticity of approximately -0.65 on traffic volumes across the cordon. The corresponding price elasticity for private trips only is -0.96. In 2009 the equivalent elasticities are higher, around -0.78 for all charged trips and -1.21 for private trips. Note that this elasticity is not comparable with, for instance, fuel price elasticity. This elasticity is considerably higher because it includes route and destination choice, as well as frequency and mode choice.

In summary, we find that the effects of the charges have increased over time. In other words, long-term effects are larger than the short-term effects. This is partially due to the fading out of the "acclimatization" effects already during the trial: the percentage decrease in traffic across the cordon stayed virtually unchanged after the first one or two months. Although they may be small in relation to the immediate possibilities to change mode or route, our evidence supports the hypothesis the possibilities for adaptation in other ways increase over time. This result is correspondence's with Goodwin (1992), who notes that price impacts tend to increase over time as consumers have more options (related to increases in real incomes, automobile ownership, and perhaps telecommunications that can substitute for physical travel).

Table 3: Cost elasticity calculations[8]

	2006	***2009***
Average distance [km]	13	13
Average marginal driving cost [€/km]	1.5	1.43
Average trip cost, price level 2006	19.5	18.5
Average percentage discount per passage because of deductibility of costs for commuting, charge reduction for company cars and inflation	0	0.16
Average charge per passage in price level of 2006 [€] (changed tax-regulations in 2009 are taken into account)	12.8	10.8
Trip cost for charged trips [€]	32.3	29.3
Charges in percent of total trip cost	66%	58%
Volume decrease across cordon (In the *2006* column, the traffic volume is compared the 2005 level. In the *2009* column, the traffic volume is compared to the hypothetical traffic flows without charges in 2009.)	-22%	-24
Share of exempt traffic	0.28	0.28
Volume decrease across cordon of charged passages	0.72	0.70
Share of heavy goods vehicles	0.18	0.18
Business trips, non-exempt	0.09	0.06
Taxi, non-exempt	0.00	0.06
Commercial traffic + exemptions	0.55	0.58
Volume decrease across cordon of private charged passages	0.62	0.57
Elasticity, all charged traffic	-0.65	-0.78
Elasticity of private trips	-0.96	-1.21

Traffic volumes on other links (not crossing the cordon)

Next, we discuss how the traffic volumes have developed inside the cordon, on important bypasses and links outside the cordon. For the inner city, a key issue is whether we can identify any trend increase in traffic volumes, indicating that the road space freed-up by the charges generates new traffic.

The traffic volumes in the inner city were 8%-9% lower in 2008 (depending on type of street) compared to the levels in 2005. Traffic volumes have largely remained unchanged between 2007 and 2008.

Drivers running between northern and southern part of Stockholm can escape charging by using the bypass E4/E20 (the western relief road) and in some cases to Södra länken (the southern relief road). The relief roads were congested already before the implementation of congestion charges and there was a great concern that congestion would become even more severe when the charges were introduced. However, the traffic volumes have remained relatively unaffected by the charges.

[8] Detailed calculations and data sources are available on request from the authors.

Traffic on orbital roads, bypass E4/E20 and Södra länken (the southern relief road), has only increased approximately 5 percent since 2005, which can be explained entirely by an increase in employed inhabitants (see Long-Term Adaptation effects). Södra länken shows a similar pattern, although the percentage increase is somewhat larger: The higher increase is largely due higher population growth in the relevant catchment-area and to ramp-up, since the link opened in 2004. However, traffic volumes on Södra länken have fallen in 2008 (down 4.6 percent, compared to 2007), for the first time since the road opened in 2004.

Figure 2 visualize the trend increases in traffic volume on bypass E4/E20 and Södra länken. Interestingly, the figure do not indicate when congestion charging system was introduced (January 2006), turned off (August 2006), and the re-introduced (August 2007), which confirms the conclusion that the charges do not have any large impact on the congestion levels on the orbital roads.

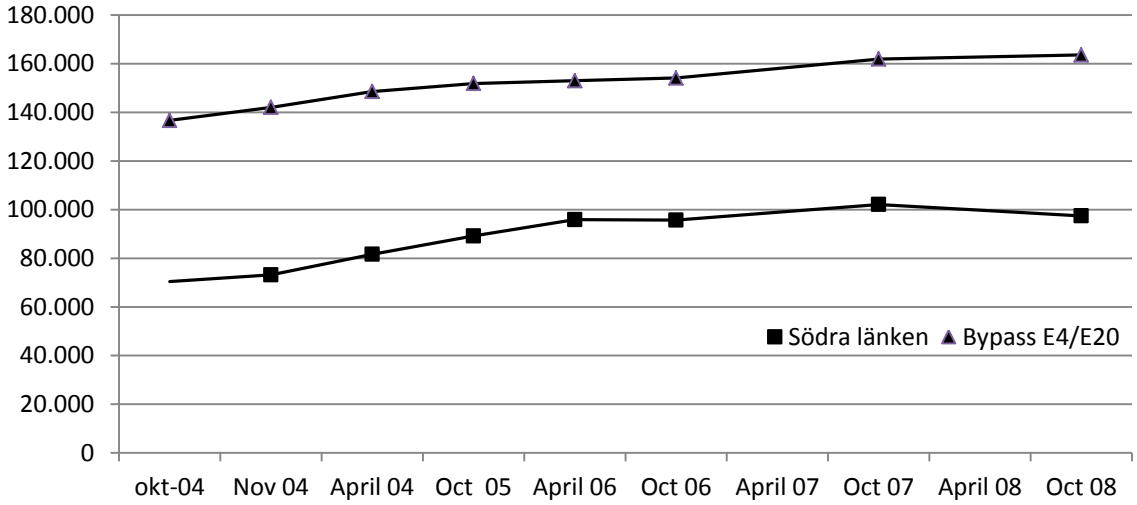

Figure 2: Traffic volumes from 2004 to 2008 on E4/E20, the bypass free of charge.

Similar positive indications are by given traffic counts on other links outside the cordon. The trend in traffic volumes has also been followed up for some particular links for which there was a concern that congestion would increase. However, these links did not suffer from any significant increase in volumes during the trial (April 2005-April 2006), and the traffic increase since then has been limited.

In summary, the cordon system in Stockholm does therefore seem not to have generated any severe second-best problems.

Journey times and congestion

The primary data source for travel times has since April 2005 been the travel time measurement camera system, operating until November 2008. Previous analyses of these display how the level of congestion was reduced and decreased travel times dramatically during the trial in 2006, especially on the approach roads but also in the inner city. When the

permanent system was introduced again in 2007 the level of congestion decreased to approximately the same levels as during the trial (Eliasson, 2008).

In 2008, the cameras were not maintained and functioning as well as previous years, and there are only data for a few links, making the comparison between years less reliable and representative. Still, measurements taken from all weekdays for approximately six consecutive weeks in October 2007 (after the charges had been reintroduced) and in October 2008 gives some evidence that the level of congestion has remained virtually unchanged since the congestion charges was re-introduced, see figure 3.

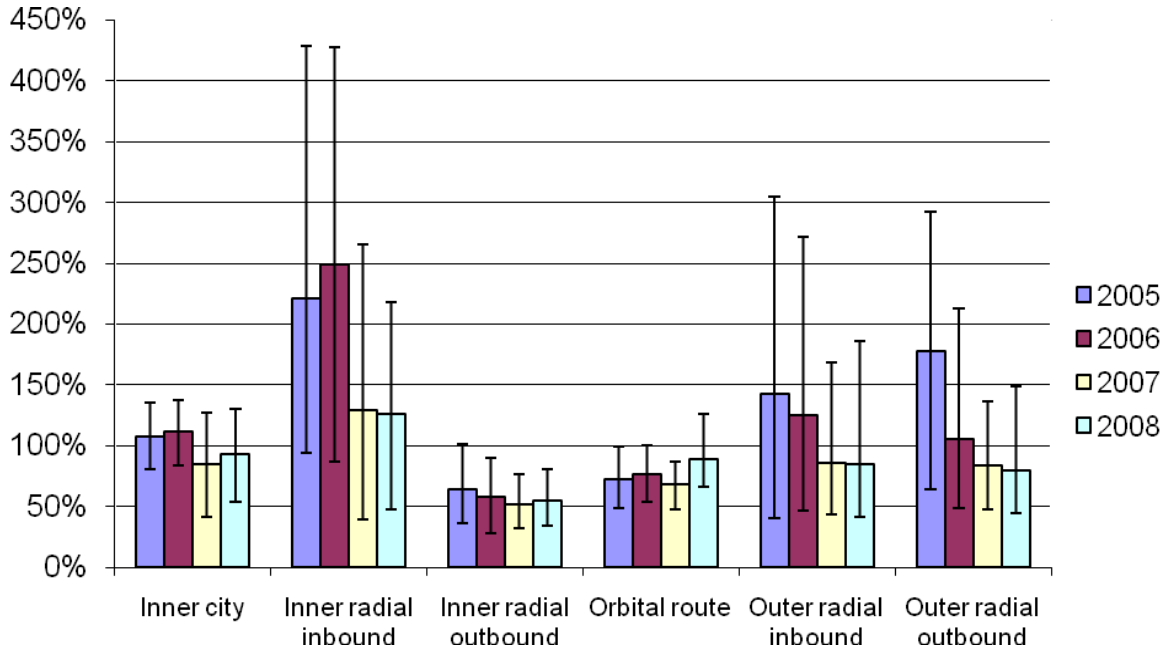

Figure 3: Travel time increase over free-flow travel time for four different types of links.

THE EXEMPTION FOR ALTERNATIVE FUEL VEHICLES

There are several incentives in Sweden to promote the sales of "clean vehicles". Fuel cost is kept low due to the fact that there is no tax on renewable fuels and there is free parking for clean vehicles in some cities. In addition to these incentives, it was decided that alternative fuel vehicles were exempt from congestion charges in Stockholm. Two key questions now emerge: Did this exemption have any effect on the sales of alternative fuel vehicles, and what effect did this exempt have on congestion levels? This section aims at addressing these questions.

At the time of the trial, "clean cars" was in Sweden defined as alternative fuel vehicles, including ethanol, biogas (CNG), hybrid and electric cars. Since the congestion charging trial, the definition of clean cars[9] has changed and includes now also petrol- and diesel cars

[9] For the Swedish definition of clean cars see the website of the Swedish National Road and Rail administration – www.trafikverket.se

emitting less than 120 g of CO_2 per km. Still, when congestion charges were introduced permanently, the old definition of clean cars was kept. The alternative fuel car exemption will now be phased out. Newly registered alternative fuel vehicles are no longer exempt and alternative fuel cars registered before 31 December 2008 is only exempt until 2012.

Effects of the alternative fuel car exemption on sales

During the trial, exempt passages across the cordon were about 28 %. Of those passages about 2% were alternative-fuel vehicles. In December 2008 the share of alternative fuel vehicles had increased to 14% (City of Stockholm Traffic Administration, 2009). This indicates that the market for alternative fuel vehicles grew considerably between 2006 and 2008.

There have been other incentives to increase the market share of clean vehicles (the new definition also including low-CO2 emission petrol and diesel cars) in Sweden both at national and local level. In the city of Stockholm, free residential parking for clean vehicles was introduced in 1997. Other measures have been e.g. no tax on renewable fuels, and obligation for each petrol station to sell at least one alternative fuel, a special queue for clean taxis at Arlanda airport, lower value of fringe benefits for tax assessment for clean company cars and a national purchase subsidy for clean vehicles of € 1 000.

In 2008 sales of clean cars grew at a record pace, in comparison to other European countries. One third of all cars sold in Stockholm and a quarter of all cars sold in Sweden were clean cars. Figure 5 shows the development of clean car sales from 2001 to 2009 for Stockholm and Sweden. Note that the "Low-CO_2 cars" were not exempt from charges.

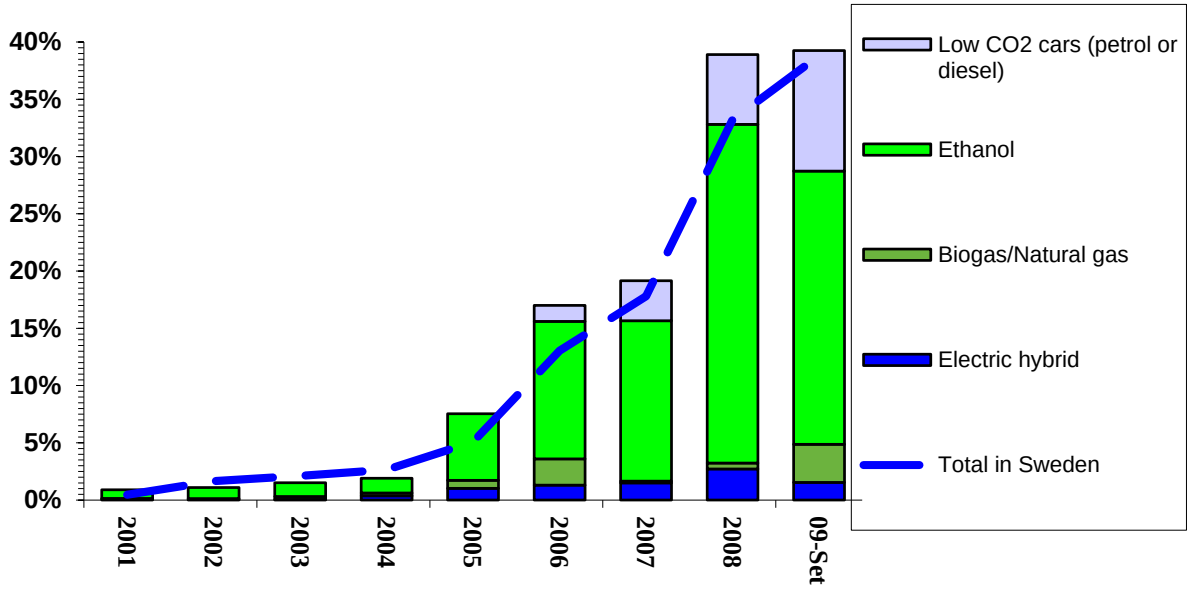

Figure 4: The development of clean car sales from 2001 to 2009. The bars show the sales in Stockholm, while the line shows the sales in Sweden as a whole (including Stockholm).

As can be seen in the figure the sales of clean cars were stronger in Stockholm than in Sweden in 2006 and 2008. In 2007, when charges were abolished the sales rate were approximately the same in Stockholm and Sweden. This indicates that the local incentive of

congestion charges exemption had a clear effect on the sales of alternative fuel cars in Stockholm.

In order to obtain a more detailed understanding of the mechanism behind the clean vehicle market, the Environment and Health Administration in Stockholm has studied the impact of different incentives on clean car sales. With statistical analyses they have quantified the importance of different factors/incentives. (City of Stockholm Environment and Health Administration, 2009b). Two types of statistical analyses were carried out; one time series analysis and a cross section analysis. The time series analysis used monthly sales data and combined it with dates of introduction of different incentives and the development of fuel prices. That gives the possibility to verify the importance of an incentive. The cross section analysis used information about the share of clean cars per municipality and how the incentives varied across these municipalities. With this analysis it is possible to verify if the share of clean vehicles depends on a local incentive. The study was carried out to investigate the market in Stockholm County.

The results showed that the most important incentive was the exemption from congestion charges. It increased sales of alternative fuel cars by 23% in Stockholm County in 2008. The lower cost for alternative fuels (compared to conventional fuels) had a similar positive effect on sales. The free residential parking for clean vehicles had a lower impact on sales. The reduction of € 1 000 on the purchase price has mainly affected the sales of small city cars with low-CO_2 emission (not exempt from the congestion charges).

The results from the statistical analysis show that to encourage the sales of clean vehicles the exemption from congestion charges had a very large impact.

Another important factor is the administrative load connected with the congestion charges. For a company, handling the payments for each passage for each vehicle is quite extensive. To facilitate this administrative burden, buying an alternative fuel car, was an option. At the same time the company was able to show their costumers that they took their environmental responsibility. The largest proportion of sold clean cars was company cars, 91 %.

Effects of exemption of alternative fuel cars on congestion levels

As for the effect on congestion, it is interesting to look at what categories of drivers are affected. The 14% of the passages that were exempt from charges being alternative fuel vehicles in December 2008 were distributed among categories according to the table below:

Table X : Categories of exempted alternative fuel vehicles passages

Category	**Share**
Taxi	2,6%
Business trips	2,9%
Private trip with fringe benefit car	5,3%
Private trip	3,2%
Total	*14,0%*

What will happen when these categories will be charged? The first three categories are likely to be less cost-sensitive than private consumers. Taxi companies charge their customers the additional charge, and companies are less cost sensitive than consumers. As for fringe benefit cars, only a minor part of the cost is taken by the driver from his own pocket depending on company policy and the fact that the congestion charge is deductable from income tax. This reasoning implies that the drivers of exempt cars are likely to be less cost sensitive than the average driver, leading to the conclusion that the exemptions did not have much effect on the traffic volumes. However, without the exemptions the revenues increase.

In conclusion, the exemption of alternative fuel vehicles was the most important economic incentive to promote sales of these cars. From that perspective, the exemption was clearly motivated. In addition, the exemption is not likely to affect the traffic volumes much.

Taking away the exemption for alternative fuel vehicles clearly increased revenues, but apart from that it could be argued that the exemption could have been kept as a means to transform the vehicle fleet without having much effect on the traffic volumes.

POLITICAL AND PUBLIC ACCEPTABILITY

Congestion charging is met with public resistance in most cities, and Stockholm was no exception. The resistance became even fiercer because of the way congestion charges were introduced. The leader of the Stockholm Social democrats, Annika Billström, had before the election promised that there would be no road pricing in Stockholm during the next election period. But after the election, the Green party forced through a "full-scale, several-year trial with congestion charges in Stockholm" as a condition for supporting a social-democratic national government. The Social democrats on the national level leaned on Mrs. Billström to accept a charging trial, not to jeopardize a social-democratic government. This breach of promise colored the debate about the congestion charges for a long time after the decision of a trial had been made, even making many potential supporters oppose the charges.

Among the many surprising experiences from the story of the Stockholm congestion charges, this is arguably the biggest: how the charges managed to survive an extremely heated process and gain both public and political support to the extent that the existence of the charges is now virtually a non-issue. In this section, we will discuss how this happened and what general lessons can be learnt. First, we give a brief review of how public and political opinions have evolved. The following sections discuss public and political acceptance. Finally, we discuss the consequences for transport investment planning in general.

A brief review of opinion and politics

When the decision was made to carry out a "congestion charging trial" in Stockholm, it was met with great resistance – although not compact. In the spring of 2004 and the spring of 2005, 40% of Stockholm citizens stated that they would "probably" or "most likely" vote yes to permanent congestion charges. Support fell, however, once the start of the trial approached. Right before the start of the trial, support had fallen to 36%, with the "most likely yes" group falling the most. Once the trial started, support increased to 52%. The media image also changed once charges were in place, from intensely critical to in many cases very positive. The share of trial-related newspaper articles with a positive angle increased from 3 % in the

autumn of 2005 to 42 % in the spring of 2006, while the share of negative newspaper articles were almost halved from 39 % to 22 % (Winslott-Hiselius et al., 2009). The trial ended July 31, 2006, and was followed by a referendum in September at the same time national and city elections were held. Excluding blank votes, 53% of Stockholm citizens voted to keep the charges. After the election, the centre/right coalition gained power both at the national level and in the city of Stockholm. The centre/right coalition in Stockholm had opposed the congestion charges, but had promised to follow the outcome of the referendum, so they had to ask the national Government to reintroduce the charges permanently. After a few weeks of consideration, the new centre/right Government said it would do so, but as a part of a broader package of transport investments in Stockholm, to be negotiated. The revenues from the congestion charges were earmarked for road investments. On the other hand, the investment package also contained major rail investments, but these were claimed to be financed by other sources of funding. After the decision to include the charges in an investment package, no political parties proposed abolishing them anymore.

The charges were reintroduced permanently in August 2007. A poll in December 2007 showed a 66% support for the charges. A poll in August 2009 phrased the question as "Do you think the congestion charges should be decreased, increased or stay as they are?". 56% wanted to keep them as they were, 18% wanted to increase them and 26% wanted to decrease them. Although the formulation of the question makes it hard to compare it with previous polls, the outcome can reasonably be interpreted as a 74% support for the charges.

Factors affecting public acceptability

Several authors have argued that acceptability of road pricing is likely to increase with familiarity (e.g. Jones, 2003), and this is supported by empirical experience (for Norwegian experience, see Tretvik, 2003, and Odeck and Bråthen, 2002; for London, see Schade and Baum, 2007). Several reasons for this phenomenon have been suggested, which may all contribute to some extent.

1. Benefits may turn out to be larger than anticipated. Several authors have noted that a main reason for the resistance against congestion charges is that they simply will not work (see e.g. Jones, 2003, and Bartley, 1995). If they in fact turn out to be effective in the sense that congestion decreases, then attitudes may turn more positive.
2. The downsides of charges – increased travel costs and/or changes in travel behavior – may turn out to be not as bad as expected. Once the charges are in place, many people may discover that the charges do not in fact affect them as much as they had thought. Stockholm evidence of this phenomenon is reported in Henriksson, 2009.
3. Once the charges are decided, resistance may decrease due to the psychological effect known as cognitive dissonance (Festinger, 1957), a phenomenon that can be simply summarized as "accept the unavoidable". In other words, once the charges are in place, it is less worthwhile to spend energy on opposing them. Schade and Baum (2007) show that respondents in an experiment are more positive to charges if they have been made to believe that charges are certain to be implemented.
4. Familiarity with road user charging may decrease the general reluctance towards pricing a previously unpriced good. There is evidence that "people in many cases do

not like prices as an allocation mechanism" (Frey, 2003, p. 65; see also Jones, 2003). But once familiar with the thought that road space is in principle a scarce good that can be priced – much like parking space or telecommunication capacity – this reluctance may tend to decrease.

While the first two reasons above are related to the objective effects of the charges (decreased travel times, increased travel costs etc.), the second two are related directly to individuals' attitudes. Attitudes, behavior, objective effects and how effects are perceived are all interrelated, as shown in Figure 6 (from Eliasson and Jonsson, 2009):

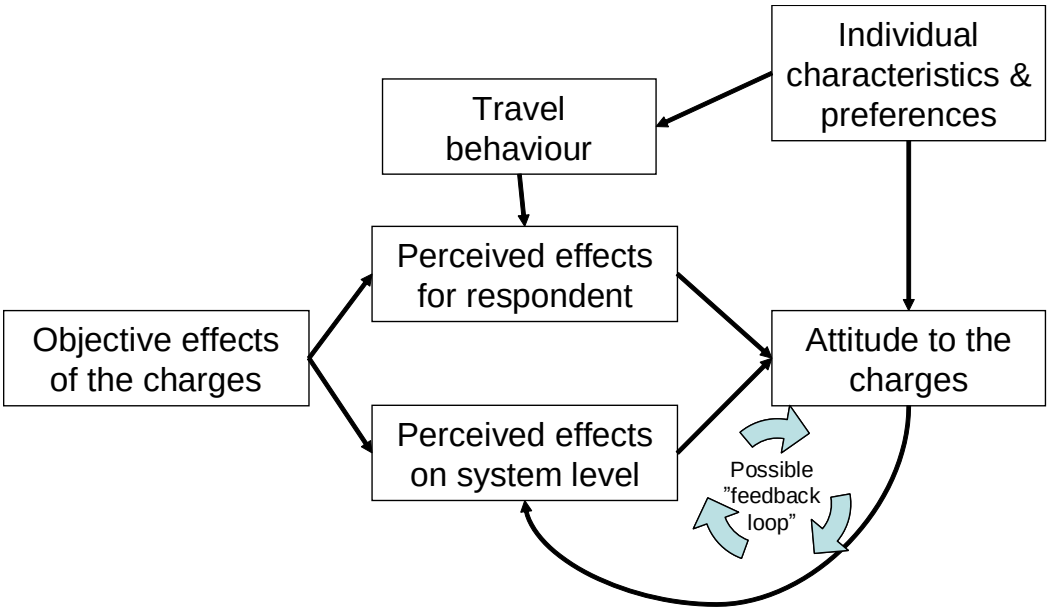

Figure 5: Interactions between attitudes, travel behavior and the objective effects of the charges.

The objective effects of the charges cause two types of perceived effects. First, there are direct effects on the individual, such as changed travel costs and travel times. Naturally, these effects depend on the individual's travel behavior. Second, there are "social" effects, system level effects that do not directly affect the individual. It is known, however, that not only direct, individual effects but also such "system" or "social" effects affect attitudes (see Jaensirisak et al. 2003; Bamberg and Rölle, 2003; Jones, 2003). Attitudes also depend on individual characteristics and preferences, such as political views, environmental concerns, acceptance of pricing as a policy instrument etc. Finally, attitudes also affect the *perception* of effects, creating a mutual dependence: a respondent with a positive attitude to charges is more inclined to believe that the charges have had beneficial effects, and vice versa. This may cause a "feedback loop" between the attitudes and the perceived system effects, where information that strengthens already held attitudes are given more weight, thereby reinforcing the attitudes (in either positive or negative direction). As Rienstra et al. (1999) concludes, claiming that congestion charging is ineffective can be a strategic response to justify a negative attitude towards charging.

Three recent papers have investigated explanatory factors behind the positive opinion in Stockholm (Hårsman and Quigley, 2009; Eliasson and Jonsson, 2009; Brundell-Freij and Jonsson, 2009). The papers have different perspectives, but taken together, they support all the processes and mechanisms described above.

- Hårsman and Quigley (2009) analyze referendum data and compare referendum results for each voting district to traffic effects and parliament election results. They show that both of these variables affect referendum results strongly. Voting districts which benefit more in terms of travel times or lose less from increased travel costs also show stronger support for the charges, and vice versa. But referendum results are also strongly correlated with general political views: the support for charges is strongly correlated with the support for political parties that support or oppose the charges.
- Eliasson and Jonsson (2009) analyse attitude data from December 2007, i.e. in a situation where respondents are familiar with the congestion charges and their effects. They show that the effects of the charges, both on an individual level and on a system level, affect acceptability. Moreover, attitudes to general environmental problems strongly affect acceptability – strong environmental concerns increase support for the charges. They also show that there is "feedback loop" between attitudes to the charges and perceived system effects: positive attitudes to the charges increase the belief that the charges have had beneficial effects, and vice versa.
- Brundell-Freij and Jonsson (2009) study how belief in the charges' effectiveness changed over time, and how this affected support for them. They conclude that belief in the charges' effectiveness strongly affects opinions about the charges, but that the increasing belief in effects during the trial cannot explain the increase in the support entirely. They argue that the cognitive-dissonance phenomenon most likely also contributed to the change in opinion. They also show that even those who did not believe in the charges effectiveness became less negative over time. This may both be due to cognitive dissonance and because they discovered that the anticipated negative effects of the charges were less than expected.

Achieving public acceptance: Moving beyond "winners/losers"

In the simplest textbook analysis of congestion charges with homogeneous users and aggregate supply and demand curves, all users will be worse off: either they are priced off the road to a second-best alternative, in which case they will obviously be worse off, or they stay on the road, in which case they will pay more than their value of the time gain. Theoretically, the revenue from the charges is sufficient to compensate the losers, so the standard recommendation in the acceptance literature is that congestion charges must be part of a "package", within which it is clear how the income is going to be spent for the advantage of the general public, if it is going to have any chance of being accepted. (See for example Hau, 1995; Johansson and Mattsson, 1995; Jones, 1991; Small, 1992; Thomson, 1998; Langmyhr, 1997). In the case of the Stockholm trial, however, virtually none of the income would be used for the direct benefit of motorists. While some of the income was used to improve public transport during the course of the trial, not many were able to take advantage of that. When the charges were reintroduced, most of the revenues were to be spent on a ring-road, which presumably increased acceptance among motorists (although there are unfortunately no studies of this). But it was evident that revenue use was less decisive for acceptance than expected.

Much of the economically oriented literature is concerned with the question of "winners" and losers" of congestion charges (see e.g. Eliasson and Mattsson, 2006), and the influence such equity effects may have on acceptability. The three papers above (especially Hårsman and Quigley) confirm that individual costs and benefits affect acceptability in the expected way. But all the papers also show that acceptance depends on many more factors than just the "winners/losers" dimension. It is also apparent that the simplest versions of transport-economic theory neglects some crucial aspects related to "winner/loser" analysis. Summing up, four conclusions regarding public acceptance can be drawn.

1. *The standard analysis of congestion charges underestimates the number of "winners" and the total benefit of congestion charging.* This is because the standard "textbook" analysis neglects three things: dynamics, network effects and user heterogeneity. In a *dynamic* model, where users can adjust their departure time, users will not necessary lose from a congestion pricing reform. In the simplest case with a single bottleneck, the optimal toll will shift travelers to arrive at a rate that never exceeds the bottleneck capacity. Hence, there will be no queue, the toll and rescheduling costs will not exceed time spent in queue before the toll, and no user will be worse off (see Vickrey, 1969; Arnott et al., 1993, 1994, 1998, 1999). *Network effects* will mean that some drivers will benefit from time savings without paying the charge. Pricing traffic in the bottleneck to reduce queues, all upstream traffic will benefit – not only drivers actually paying the charge. *Heterogeneity* among travelers will mean that congestion charges will tend to "sort" trips such that high-valued trips will stay on the road (and enjoy time benefits), while low-valued ones will be priced off. Selection effects of this type will in general be stronger in transport systems providing travelers the option to used alternative routes or modes. From an acceptance perspective, the important point is that individuals can belong to different valuation "groups" on different days or different journeys.
2. *Perceived social costs and benefits strongly affect acceptability*. In other words, it is not just perceived individual benefits that determine acceptability. Hence, the "branding" of the charges matters – how they are marketed, explained and perceived. A condition for this to be possible is that the system design is well aligned with the stated purpose of the charges. In Stockholm, the support for the charges was closely correlated to general environmental attitudes. Hence, the labeling of the charges as "environmental charges" and emphasizing their positive effects on air quality probably increased acceptability. While most of the social benefits of congestion charges will in general be time savings, decreasing car traffic will also generate environmental benefits, such as improved local air quality, perceived urban environment and (to some extent) reduced carbon emissions. Many people are ready to suffer inconvenience or increased costs for the environment, while much fewer are prepared to suffer to achieve a more economically efficient use of scarce road capacity. If congestion charges is marketed only in the latter way, then it seems unlikely that they will ever be introduced.
3. *Identifying "winners/losers" rapidly becomes impossible.* Travel patterns are not static. Even when no external conditions change, travel patterns are much less

repetitive and stable than many people think. Many of the affected drivers will be "occasional car drivers", who drive on the charged road perhaps a couple of times each month. Less than a third of car drivers across the Stockholm cordon are "habitual" car drivers that pass the cordon each day. Moreover, identifying "winners" and "losers" is in fact only possible in the short term. Over a longer time period – a few years – the entire choice context (workplace and residence location, scheduling restrictions, leisure activities) will have changed. The charges will then have changed from being an "external shock" to being a factor considered when making all these choices. In that perspective, "winners/losers" will be impossible to identify. This is illustrated by the finding that when motorists in Stockholm were asked if the congestion charging had made them change their travelling habits, there were too few answering "yes" to correspond with the actual reduction in measured traffic volumes. Car drivers had apparently changed behavior without even noticing it.

4. *Preferences and attitudes are not static.* As discussed above, the introduction of congestion charges may in itself change attitudes, through processes such as cognitive dissonance or less resistance against pricing as policy measure. The paper by Quigley and Hårsman also shows that attitudes to charges are correlated to the standpoints of the political parties – and these may change over time. In the Stockholm case, one may presume that the fact that all political parties now support the charges have increased acceptance further.

The concept of "fair" charges

Another problem with the "winners/losers" perspective concerns the way this translates to the question of "fairness". Often, if a system affects high-income groups more than low-income groups, it is claimed to be a "fair" system. Hence, "fairness" considerations – which are known to affect acceptability – are interpreted as a question of identifying "winners and losers". In Stockholm, the equity effects were generally speaking progressive: high-income groups paid more than low-income groups, men paid more than women, employed more than non-employed etc. (Details can be found in Eliasson and Mattsson, 2006; Eliasson and Levander, 2006; Franklin and Karlström, 2009; Franklin et al., 2009).

But once the charges are in place, and the short-term winner/loser perspective fades, another perspective becomes more important – what price is actually "fair" to charge for a car trip? From this perspective, it is "fair" that one pays more to drive on a congested road or to cause emissions in densely populated areas – irrespective of income or place of residence, or what a hypothetical travel pattern would have been without the charges. This means that a system needs to be perceived as "fair" in this sense: it needs to be consistent with its stated objective. In Stockholm, one of the most common objections to the system is why traffic within the cordon is not charged. Although there are two good answers to this (the congestion is mainly located on the arterials along the cordon; most of the traffic inside the cordon crosses the cordon at some point on the trip), this shows how the debate has moved from "who wins/loses" to "what's fair relative to the objectives".

Political acceptability

Political acceptability is different from public acceptability. Obviously, political acceptability will be influenced by the level of public acceptability – but public acceptability is neither a necessary nor a sufficient condition for political acceptability. Crucial for the analysis and understanding of political acceptability are power issues: the power over the design of the charging scheme, the power over the revenues, and how the charges and its revenue stream will affect decisions and funding of transport investments in general. That congestion charges is now politically accepted in Sweden is not only, or perhaps not even primarily, due to the higher public support. It is also because the charges have been integrated in the general transport investment planning process, and this has – at least partly – solved the power and negotiation issues above.

To understand the political and institutional drivers behind this development, one must start with the legal context. Swedish congestion charges are not "charges" but national "taxes" from a legal point of view. Existing infrastructure cannot be "charged", only "taxed", according to the constitution's definition of a charge, and Swedish municipalities[10] cannot levy taxes on other than their own citizens. Hence, although it was the city of Stockholm that was responsible for designing the charging system and carrying out the congestion charging trial, the responsibility of actually levying and administrating them had to be born by the national government[11]. More important, this meant that it is the national government that has the formal power over both scheme design and revenues. Although the Government promised to refund the revenues to the Stockholm region, disagreements quickly emerged (as expected): how revenues should be calculated (for example, should operating costs be subtracted) and how revenues should be used. Regarding scheme design, there were disagreements regarding which vehicles should be exempted, and further disagreements (such as if and how charge levels should change along with inflation and economic growth) were to be expected. Many politicians have stated that the uncertainty about the political power over scheme design and revenues was their main argument against introducing the congestion charge.

Adding to these uncertainties was the uncertainty about how the existence of the new revenue stream would affect the complicated negotiation between national and regional levels about national infrastructure grants. Most of the major transport investments in Sweden are paid by the national government, whereas municipalities and regions are responsible for local streets and transit operation. As expected, there is often disagreement where the border between different responsibilities should lie. The politicians in Stockholm, regardless of political color, had long argued that they were not getting their fair share of national infrastructure grants. Whether this claim was founded or not, this meant that the arrival of a new revenue stream in the form of congestion charges was not necessarily welcomed. Several politicians feared that this would mean that Stockholm would have to pay an even larger share of transport investments with their own money. The government, they argued, would point to the revenues from the congestion charges and claim that Stockholm obviously needed even less national infrastructure grants than before.

[10] A "municipality" ("kommun" in Swedish) is the smallest geographical administrative unit in Sweden, roughly corresponding to a city. Most of the spatial planning responsibility, including infrastructure planning, lies at the municipal level.
[11] This task was given to the National Road Administration, and later moved to the National Transport Agency.

The solution to this dilemma was the so-called "Cederschiöld agreement", named after the chief negotiator appointed by the Government. In this agreement, the charge revenues were funding parts of a major transport investment package, where the national government also made a major funding commitment – much larger than had been the case for a long time. The charge revenues were earmarked for the road investments in the agreement, while the substantial rail investments were claimed to be paid for with money from other sources. An agreement was settled in late 2007, eventually only between centre/right parties on the national and regional levels. With this, support for the charges had been secured from regional politicians of all parties. Ironically, the Cederschiöld agreement contained several investments that the Left and Green parties – the original main proponents of congestion charges – had been opposing for many years. The result was a situation where all parties agreed to keep the congestion charges, but with different main motives, ranging from car traffic reduction (Lefts and Greens) to investment funding (centre/right parties), and with different opinions regarding how the revenues should be used.

The impact on the Swedish transport investment planning process

The Cederschiöld agreement was a forerunner for a major change in the Swedish investment planning process. As a part of the preparation of the national investment plan 2010-2021, the Government declared that investments that received regional co-funding would be higher prioritized. There were two reasons for this: increase the total amount of available funds, and give regions better incentives to prioritize among their suggested investments. Regional co-funding could come from any source, but several regions jumped at the opportunity to introduce congestion charges as a means to obtain such funding. Congestion charges are in fact now being introduced in several other cities, with Gothenburg (Sweden's second largest city) leading the way. In these cases, the financial aspect and the connection to an investment package is even clearer than in Stockholm. Financing investments is the main motivation for introducing chargesm which was never the main motive in Stockholm. In several cases, "congestion" charges is a misnomer, since the cities have no traffic congestion at all (with Gothenburg a possible exception). Gothenburg is a particularly illuminating example of the loose connection between public and political acceptance. In Gothenburg, a broad political consensus was formed, where congestion charges would pay for roughly half of a large investment package, with the other half coming from the Government. This is a surprising and stark contrast to the extreme controversy when Stockholm introduced charges, and even more surprising considering that acceptability levels in Gothenburg have always been very low, typically hovering around 20%. Despite this, Gothenburg politicians from all parties are now embracing congestion charges.

Giving regions the incentive and opportunity to introduce road user charges to obtain transport investments, where regional funds are leveraged by national funds, may fundamentally change the transport investment planning process. There are several advantages: Regions get an incentive to prioritize between transport investments and other responsibilities, as they are forced to "put their money where their mouth is". When there is congestion, regions are more likely to introduce congestion charges, which obviously is a potent and efficient policy measure. On the other hand, there are several disadvantages: Since regional funding is leveraged, regions will be tempted to overinvest in transport infrastructure relative to other types of (non-leveraged) spending. Charging traffic above the marginal social cost – which financing charges likely will – will in general cause welfare losses (although this

depends on the net benefit of the investment and the deadweight loss of alternative funding sources). Whether future Governments will be able to control what they have let loose remains to be seen.

CONCLUSIONS

When congestion charges were introduced in Stockholm January 2006, the effects were substantial and immediate. Since then, however, there has been an ongoing discussion about whether the effects are likely to wear off over time, when drivers get used to paying the charge. In this paper, we have shown that the effects of the charges have instead increased slightly over time, once factors such as employment growth, inflation and deductability are controlled for. In other words, the long-term cost elasticity turns out to be somewhat higher than the short-term cost elasticity. This is in line with what is usually found when comparing long and short-term elasticities, since more adaptation mechanisms are available in the longer term.

Two other fears were that the charges would lead to increased congestion problems on other links, especially the bypasses, or that the freed-up road speace within the cordon would quickly be filled up with other traffic. After four years, there is no evidence of these effects. Similarly, the improvements of travel times and travel time variability remain (although in this case, data for 2009 is scarce).

In an effort to stimulate demand for alternative-fuel vehicles, such vehicles have been exmpted from the charge up until the end of 2009. This policy has had a considerable effect: the share of alternative-fuel vehicles across the cordon has increase eightfold, from barely 2% in 2006 to 15% in 2009. There are also other policy measures stimulating demand for alternative-fuel vehicles, but it appears that the exemption from congestion charges stands for a substantial share of the total effect. It can been argued that rather than subsidizing alternative-fuel vehicles, subsidies should encourage low-carbon vehicles regardless of fuel. Regardless of this, it is interesting to conclude that congestion charges can apparently serve as a potent policy measure not only for combatting congestion, but also for affecting the long-term car fleet composition.

Perhaps the most surprising with the Stockholm charges was the change in public and political acceptance, from vehemently negative to a considerable support. Around 2/3 of the public support the charges, and no political party supports abolishing them. We argue that it is necessary to consider public and political acceptance separately: while political support is certainly connected to public opinion, public support is neither a necessary nor a sufficient condition for political support.

The essential factor for achieving political support in Sweden for congestion charges is the integration of the charges in the national investment planning processs, thereby giving local and regional politicians a substantial influence over the use of the revenues. Political support would most likely increase further if regional politicians were given more power over system design (charge levels, exemptions etc.). Moreover, the charge revenues are leveraged with additional national investment funding. The practice of leveraging regional funds with national ones can prove troublesome, since it creates incentives to over-invest in transport

investments compared to other public sectors. However, this is still an improvement compared to past practice, where regions seldom had to co-fund transport investments at all.

There seem to be several reasons contributing to the public support for the congestion charges in Stockholm. The most striking effects were of course the reductions of congestion and emissions, and this has certainly increased support for the charges. But conversely, the discovery that the charges were not as bad as feared also played a role: adaptation and increased travel costs turned out be less of burden than many seem to have thought, especially seen over a longer time period. Cognitive dissonance also appeared to have played a role. Finally, the generally high environmental concerns of the Stockholm population, together with the decision to emphasize the environmental benefits of the charges, were an important factor.

Introducing congestion charges through a referendum was a complicated, risky and potentially expensive method. In general, it is probably wise to avoid breaking out such complicated questions as congestion charges from their context and framing them as a simple ”yes/no” question. The post-Stockholm development in Sweden support that once congestion charges are put in a institutional context where political power issues are resolved. Building on this approach, combining it with the lessons regarding gaining public acceptance discussed above, is most likely a safer and cheaper way to introduce congestion charge. But in some circumstances, a referendum may be the only way forward. Given the considerable potential benefits and the lack of other efficient solutions to congestion problems, the risk may sometimes be worth it. In that case, scheduling a referendum to immediately before a possible introduction will likely spell defeat. At that point in time, downsides will appear immediate, certain and most likely exaggerated, while upsides remain remote and uncertain. Given this, a ”trial” period might be a prudent way to introduce congestion charges – which, given the Stockholm experiences, seem to continue to earn their reputation as one the most cost-efficient improvement transport planners have at their disposal.

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